

AMENDMENT TO THE CLAIMS

1. (Original) A radar gauge adapted to sense fluid level in a tank, comprising:

- a radar gauge circuit adapted to receive a transmit frequency and a sample frequency controlling radar transmission and level sampling respectively, the radar gauge circuit generating a level output;
- a clock source generating first and second clock frequencies and having a control input setting a first frequency separation between the first and second clock frequencies;
- a separation sensing circuit coupled to the clock source and generating an evaluation output as a function of the first frequency separation;
- a controller receiving the evaluation output, the controller having a timer that measures the frequency separation and a control output feeding back to the control input that stabilizes the first separation as a function of timing the evaluation outputs, the controller further having a correction circuit that corrects the level output as a function of the first frequency separation;
- a divider circuit dividing the first and second clock frequencies and generating the transmit and the sample frequencies wherein the transmit and sample frequencies are separated from each other by a second frequency separation; and
- the separation sensing circuit further coupling to the divider circuit and generating a second evaluation output coupling to the controller as a function of the second frequency separation.

2. (Original) The radar gauge of claim 1 wherein the separation sensing circuit further comprises:

a circuit sensing a polarity of the sample clock and generating a further evaluation output representative of the polarity.

3. (Original) The radar gauge of claim 1 wherein the clock source comprises a voltage controlled oscillator controlled by the control output and generating the second clock frequency.

4. (Original) The radar gauge of claim 3 wherein the controller comprises a digital-to-analog converter generating the control output.

5. (Original) The radar gauge of claim 1 wherein the controller includes a timer measuring time intervals of an evaluation output.

6. (Original) The radar gauge of claim 5 wherein the level output includes a current calculated distance that is a function of a current timer measurement.

7. (Original) The radar gauge of claim 1 wherein the controller includes a timer performing a timer measurement of a count an evaluation output during a time interval.

8. (Original) The radar gauge of claim 7 wherein the level output includes a current calculated distance that is a function of a current timer measurement.

9. (Original) The radar gauge of claim 1 wherein the radar gauge circuit includes a transmit pulse generator and a sample pulse generator controlled respectively by the transmit clock and the

sample clock.

10. (Original) The radar gauge of claim 1 wherein the radar gauge is energized solely by a 4-20 mA analog current and includes a voltage regulator energized by the 4-20 mA analog current.

11. (Original) A method of stabilizing clock generation in a radar gauge adapted to sense fluid level in a tank, comprising:

generating first and second clock frequencies separated from each other by a first frequency separation controlled by a control input;

generating a first evaluation output as a function of the first frequency separation;

generating a control output feeding back to the control input that stabilizes the first separation as a function of the evaluation output;

generating a level output as a function of the stabilized first frequency separation, the level output corrected as a function of the first frequency separation;

dividing the first and second clock frequencies to generate the transmit and sample frequencies separated from each other by a second frequency separation;

generating a second evaluation output as a function of the second frequency separation;

generating the control output as a further function of the second evaluation output; and

correcting the level output as a function of the second evaluation output.

12. (Original) The method of claim 11, further comprising:

sensing a polarity of the sample clock and generating a further evaluation output representative of the polarity.

13. (Original) The method of claim 11 further comprising:
generating the second clock frequency in a voltage controlled oscillator wherein an oscillator control voltage is controlled by the control output.
14. (Original) The method of claim 13 further comprising:
generating the oscillator control voltage in a digital-to-analog converter.
15. (Original) A radar gauge adapted to sense fluid level in a tank, comprising:
 - means for receiving a transmit frequency and a sample frequency controlling radar transmission and level sampling respectively, and for generating a level output;
 - means for generating first and second clock frequencies separated from each other by a first frequency separation, the clock source having a control input setting the first separation;
 - means for dividing the first and second clock frequencies and for generating the transmit and sample clock frequencies separated from each other by a second frequency separation;
 - means for sensing the first and second frequency separations and generating evaluation outputs as functions of the first and second frequency separations; and
 - means for controlling a control output feeding back to the control input, stabilizing the first separation as a function of the evaluation outputs.
16. (Original) The radar gauge of claim 15, further comprising:
 - means for sensing a polarity of the sample clock and

generating a further evaluation output representative of the polarity.

17. (Twice Amended) A radar gauge adapted to sense fluid level in a tank, the gauge comprising:

a radar gauge circuit adapted to receive a transmit frequency and a sample frequency controlling radar transmission and level sampling respectively, the radar gauge circuit generating a level output;

a clock source generating first and second clock frequencies and having a control input setting a first frequency separation between the first and second clock frequencies;

a separation sensing circuit coupled to the clock source and generating an evaluation output as a function of the first frequency separation;—and

a controller receiving the evaluation output, the controller having a timer that measures the frequency separation and a control output feeding back to the control input that stabilizes the first separation as a function of timing the evaluation outputs; the controller further having a correction circuit that corrects the level output as a function of the first frequency separation;

a circuit processing the first and second clock frequencies to generate third and fourth frequencies separated from each other by a second frequency separation; and

wherein the separation circuit generates a second evaluation output as a function of the second frequency separation.

18. (Previously Presented) The gauge of claim 17, and further comprising a circuit sensing a polarity of the sample clock and generating a further evaluation output representative of the

polarity.

19. (Previously Presented) The gauge of claim 17, wherein the further evaluation output is provided to the controller, which controller then uses the further evaluation output to generate, in part, the control input.

20. (Previously Presented) The gauge of claim 17, wherein the circuit sensing the polarity is embodied on a D-flip flop.

21. (Previously Presented) The gauge of claim 20, wherein the D flip flop is a 7474 clocked D-flip flop.

22. (Previously Presented) The gauge of claim 17, wherein the clock source further includes a voltage controlled oscillator (VCO) coupled to the control input.

23. (Previously Presented) The gauge of claim 17, wherein the separation sensing circuit is embodied on a D-flip flop.

24. (Previously Presented) The gauge of claim 23, wherein the D-flip flop is clocked 7474 D-flip flop.

25. (Previously Presented) The gauge of claim 17, and further comprising a divider circuit dividing the first and second clock frequencies and generating the transmit and sample frequencies wherein the transmit and sample frequencies are separated by a second frequency separation and wherein the first frequency separation is higher than the second frequency separation.

26. (Previously Presented) A method of stabilizing clock generation in a radar gauge adapted to sense fluid level in a tank, comprising:

generating first and second clock frequencies separated from each other by a frequency separation controlled by a control input;
generating a first evaluation output as a function of the frequency separation;
generating a control output feeding back to the control input that stabilizes the separation as a function of the evaluation output;
generating a level output as a function of the stabilized frequency separation, the level output corrected as a function of the frequency separation;
generating an indication of the polarity of the sample clock;
generating the control output as a further function of the evaluation output and the polarity indication; and
correcting the level output as a function of the evaluation output.

27. (Previously Presented) A radar gauge adapted to sense fluid level in a tank, the gauge comprising:

a radar gauge circuit adapted to receive a transmit frequency and a sample frequency controlling radar transmission and level sampling respectively, the radar gauge circuit generating a level output;
an unstabilized clock generating a first clock frequency;
a controllable oscillator generating a second clock frequency, the oscillator having a control input setting a first frequency separation between the first and second clock frequencies, the transmit and sample frequencies being related to the first and second clock frequencies;
a separation sensing circuit coupled to unstabilized clock and the controllable oscillator, the sensing circuit

generating a separation output as a function of the first frequency separation;
a controller coupled to the radar gauge circuit and providing the level output; and
wherein the separation output is operably coupled to the control input such that the first frequency separation is stabilized.

28. (Previously Presented) The gauge of claim 27, wherein the separation output is operably coupled to the control input through the controller.

29. (Previously Presented) The gauge of claim 28, and further comprising polarity sensing circuitry coupled to the sample clock and the controller, the polarity sensing circuitry being adapted to sense polarity of the sample clock, and provide a polarity output, and wherein the control input is based, at least in part, upon the first frequency separation and the polarity output.

30. (Previously Presented) The gauge of claim 29, wherein the controller is adapted to correct the level output as a function of the first frequency separation.